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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/584,813	06/27/2006	Toshiaki Kawanishi	930055-2045	4947

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EXAMINER	
SAKELARIS, SALLY A	

ART UNIT	PAPER NUMBER
1797	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/584,813	KAWANISHI ET AL.	
	Examiner	Art Unit	
	SALLY A. SAKELARIS	1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 April 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-8,10,12 and 15-19* is/are pending in the application.

4a) Of the above claim(s) *1-7* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *8,10,12 and 15-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application.
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 4/28/2010 has been entered.

Claims 1-7 have been withdrawn from consideration. Claims 9, 11, 13, and 14 have been cancelled. Claims 8, 10, 12, and 15-19 remain pending.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

1. Claims 8, 10, 12, 15-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stanbro et al. (US 4,728,882) in view of Suzuki (US 5747669) and in further view of Hobbs et al. (US 5522980).

With regard to claim 8, Stanbro et al. teach an alcohol concentration sensor of an electrostatic capacitance type for measuring an alcohol concentration in fuel for internal combustion engine mixed with alcohol in Figure 1, comprising: an insulating substrate (14); and a pair of electrodes (10) and (12), arranged on a surface of the insulating substrate to produce an electrostatic capacitance, wherein the insulating substrate is made of a material showing a low dielectric constant (Col. 7 line 55) in their alumina substrate. Stanbro further teach the use of

additional, low dielectric constant materials as layers that comprise their substrate such as dielectric silicone rubber which has a dielectric constant of approximately 3 (Col. 7 lines 18-20). Stanbro et al. further teach that the above sensor wherein each pair of electrodes is at least covered partly by an insulating protective film (Fig.1 (16)) and further in Col. 4 line 41 that the thickness of the insulating layer (16) to be 1 to 2.5 microns. In addition, Stanbro et al. teaches a case and ends of electrodes. Stanbro also teach a case that exposes part of the insulating substrate to the outside in Figure 1 and in the abstract.

With regard to claim 8, Stanbro does not teach a pair of lead-out electrodes connected respectively to the pair of electrodes and a resin mold that exposes at least a part of the surface of the insulation substrate and capable of sealing connection ends of the lead out electrodes connected to the electrodes and a part of the insulating substrate. Furthermore, Stanbro et al. does not teach the insulating substrate is made from a material showing a specific dielectric constant of not higher than 5.

With regard to claim 8, Suzuki teaches a pair of lead-out electrodes (i.e., Col. 2 lines 43-67) connected respectively to the pair of electrodes (Col. 3 lines 46-53). Furthermore, Suzuki et al teach a resin cover (Col. 11 lines 13-50) wherein the connection ends of the lead-out electrodes and a part of the insulating substrate are sealed by the resin mold forming a resin-sealed body (Figures 12A and 11D for example, Col. 11 lines 4-25). Suzuki further teach in Figure 12A that when in use, the lead plate pair 115a, 115b is connected to an external circuit, and the sensor chip 102 is immersed in liquid to measure an oxygen concentration of the liquid. The resin molded structure 126 supports the sensor chip and provides an insulating surface convenient for use. A tester may grip the resin molded structure 126 and/or the lead plates 115a

and 115b to handle the oxygen electrode, so that unnecessary stress will not be applied to the sensor chip.

It would have been obvious at the time the invention was made to one of ordinary skill in the art to have used the resin mold cover, thin film electrodes and lead-out electrode arrangement of Suzuki et al. around and within the sensor of Stanbro as the introduction of thin film electrodes confers benefits of lower volume, weight, cost, and higher application temperature to the apparatus. Further, the addition of the cover would provide increased protection and a grip by which a tester would use when submerging the tester in a sample.

Lastly with regard to claim 8, Suzuki teaches that their electrodes are positioned on a substrate made from glass that has a thickness of between 200 and 1000μm, specifically 500 μm (Col 5, lines 16-21). (Applicant should note that in applicant's disclosure [0060] glass is taught as having a dielectric constant less than 5 and this is furthermore well known in the art).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to have used the glass substrate taught by Suzuki as the substrate in Stanbro as doing so would eliminate the need for using additional insulating layers such as the rubber layer taught by Stanbro in an attempt to decrease the dielectric constant of the substrate and to therefore increase its efficiency at the same time as decreasing the overall size of the device increasing its portability.

With regard to claim 8, Stanbro et al. nor Suzuki et al. teach that their insulating layers having a thickness between 0.4 and 1 μm.

Hobbs et al. teach a gas sensor and sensing device that consists of conductors being supported by a glass substrate with a thickness of "about 1mm" (i.e., 1000 μm) and an insulating layer having a thickness of "about 0.5 microns" (i.e., 0.5 μm).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to have made the thickness of the substrate of Stanbro in view of Suzuki to between 200 and 1000μm and the insulating layer to a thickness of between 0.4 and 1 μm in light of Hobbs et al.'s teachings that the thinner layers will allow for the entire device to be compact and well suited for mass production (Col. 2 lines 48 and 49). Furthermore, it should be noted that in the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a *prima facie* case of obviousness exists. *In re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); *In re Woodruff*, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990) (The prior art taught carbon monoxide concentrations of "about 1-5%" while the claim was limited to "more than 5%." The court held that "about 1-5%" allowed for concentrations slightly above 5% thus the ranges overlapped.); *In re Geisler*, 116 F.3d 1465, 1469-71, 43 USPQ2d 1362, 1365-66 (Fed. Cir. 1997) (Claim reciting thickness of a protective layer as falling within a range of "50 to 100 Angstroms" considered *prima facie* obvious in view of prior art reference teaching that "for suitable protection, the thickness of the protective layer should be not less than about 10 nm [i.e., 100 Angstroms]." The court stated that "by stating that 'suitable protection' is provided if the protective layer is 'about' 100 Angstroms thick, [the prior art reference] directly teaches the use of a thickness within [applicant's] claimed range."). Similarly, a *prima facie* case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties. *Titanium Metals Corp.*

of America v. Banner, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985) (Court held as proper a rejection of a claim directed to an alloy of "having 0.8% nickel, 0.3% molybdenum, up to 0.1% iron, balance titanium" as obvious over a reference disclosing alloys of 0.75% nickel, 0.25% molybdenum, balance titanium and 0.94% nickel, 0.31% molybdenum, balance titanium.).

With regard to claims 10 and 19, Stanbro do not teach that their electrodes are between 0.01 and 0.8 μm or are of the thin film variety.

Suzuki teach in their figures 2A and 3A for example an electrode wherein a chromium thin film layer K1 of 40nm and a gold layer K2 of 150 nm are vapor deposited in vacuum in this order. Furthermore it should be noted that the total thickness then of this electrode would be 190nm which is 0.19 μm (Col. 6 lines 1-11).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to have used the thin film electrodes at the thickness taught by Suzukie within the sensor of Stanbro as the introduction of thin film electrodes confers benefits of lower volume, weight, cost, and higher application temperature to the apparatus.

With regard to claim 12, Stanbro et al. teach that the insulating protective film is made of parylene polymer (Col. 4 line 41) whose dielectric constant is well known by a person of skill in the art to be less than 5, but is further evidenced herein by the *Parylene Properties and Characteristics* guide to be less than 5 on Pg 2.

With regard to claim 15, Stanbro et al. teach an oscillation circuit (Fig. 8 and 9) including a pair of electrodes (32) and a processing section for computationally determining the alcohol concentration according to an oscillation frequency of the oscillation circuit via the schematic shown in Figure 9 and microcomputer (72).

With regard to claims 16, Stanbro et al. teach a processing section that computationally determines the alcohol concentration using a calibration curve in their microprocessor system of Figure 9. The output frequency of each oscillator (62,64) is fed to an associated counter (66,68) which sends the frequency count in digital form via bus 70 to microprocessor 72. A look up table containing data similar to that shown in Fig.2, is stored in the microcomputer and a determination of the concentration of the analyte in the fluid medium is made (Col. 9 lines 40-59).

With regard to claim 17, the look up table within the microprocessor includes a relationship that corresponds to the alcohol concentration and the oscillation circuit, namely the determination of the concentration of the analyte in the fluid medium is made (Col. 9 line 50-55) within the range of 0-5% accuracy.

With regard to claim 18, Stanbro teach that the apparatus determines the concentration of hydrocarbons such as hexane, heptane, benzene, and cyclohexane which are all constituent elements of gasoline (Figure 2).

Response to Arguments

Applicant's arguments with respect to claims 8, 10, 12, and 15-19 have been considered but are moot in view of the new ground(s) of rejection in view of Suzuki.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SALLY A. SAKELARIS whose telephone number is (571)272-6297. The examiner can normally be reached on Monday-Friday 8-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill Warden can be reached on 5712721267. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Sally A Sakelaris/

Examiner, Art Unit 1797

8/10/2010